REMARKS/ARGUMENTS

Claims 1-30 are pending in the present application. New claims 26-30 have been added. No new matter has been added in either the amended or new claims. Consideration of the claims is respectfully requested.

Claims 1-25 were previously rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,144,353 to McKnight.

I. The Pending claims

As was previously discussed, the present application is directed to a method and apparatus for improved performance liquid crystal displays. As illustrated in the embodiment in Fig. 1B, a display field would be fully painted almost a full millisecond before the prior art display was fully painted in Fig. 1A. A reason for this was because in the embodiment in Fig. 1B, the "slow" dark to bright transition began at approximately the beginning of the field. Further, as illustrated in the embodiments, the transition voltages are applied to pixel electrodes, not a common electrode, such as a cover glass.

Amended claim 1 clarifies the scope of the invention by explicitly including the limitation that step a) is applied to pixel electrodes and steps a)-d) occur all within the same display field. For example, steps a) and b) now recite:

> a) applying a single transition voltage to the plurality of pixel elements via pixel electrodes on the display during a first period of time within a first field time, each pixel element including a liquid crystal material having at least a first state and a second state, wherein a transition of the liquid crystal material from the first state to the second state has an associated first transition time, wherein a transition of the liquid crystal material from the second state to the first state has an associated second transition time, wherein the first transition time is longer than the second transition time, and wherein the single transition voltage induces liquid crystal material in each pixel element to begin transitioning to the second state; thereafter
>
> b) while each pixel element is transitioning to the second state, applying a first paint voltage to one pixel element of the plurality of pixel elements during a second period of time within the first field time, wherein the first paint voltage induces liquid crystal material in the one pixel element to a third state.

The process is then substantially repeated for the next display field as recited in steps e)-h).

Amended claim 22 also includes similar limitations. Specifically, claim 25 recites:

applying a first voltage to pixel electrodes of a plurality of pixels of the liquid crystal display to initiate a transition of liquid crystal material in the plurality of pixels to a clear state within a first color field; thereafter

applying a first drive voltage to a pixel electrode of at least one pixel of the plurality of pixels to initiate a transition of liquid crystal material in at least one pixel into a second state within the first color field.

II. McKnight

McKnight appears to disclose a display system in which for one frame or sub frame, a display is quickly driven dark and held dark for a period of time, Fig. 2C, t0-t1, while pixel data is loaded onto the pixel electrodes, col. 9, lines 39-41. To drive the display dark, the cover glass voltage (Vcg 151) is driven to Vb for time t0-t1. It is noted, that Vcg is applied to a common electrode, the cover glass, and not individual pixel electrodes. Between t1 and t2, the Vcg is grounded, and the liquid crystal material in a pixel obtains a pixel intensity curve as seen in Fig. 2C, 154.

This process is then repeated for the next frame, in Fig. 2C, t2-t3, and t3-t4, where Vcg=Vb for t2-t3, and then during t3-t4, the pixel obtains a pixel intensity curve as seen in Fig. 3C, 155. The process is then repeated for the next frame, in Fig. 2C, t4-t6, etc.

The Examiner previously asserted that applying voltages to pixels within a first period of time, t1-t2, and within a second period of time t2-t3 read upon the previously pending claims. The undersigned notes that the "first period of time" and the "second period of time" in McKnight actually refer to different frames or sub frames of display data.

III. McKnight Distinguished

A. Claim 1

Claim 1, as amended is not disclosed, taught, or suggested by McKnight. As discussed above, claim 1 now recites:

a) applying a single transition voltage to the plurality of pixel elements via pixel electrodes on the display during a first period of time within a first field time, each pixel element including a liquid crystal material having at least a first state and a second state, wherein a transition of the liquid crystal material from the first state to the second state has an associated first transition time, wherein a transition of the liquid crystal material from the second state to the first state has an associated second transition time, wherein the first transition time is longer than the second transition time, and wherein the single transition voltage induces liquid crystal material in each pixel element to begin transitioning to the second state; thereafter

b) while each pixel element is transitioning to the second state, applying a first paint voltage to one pixel element of the plurality of pixel elements during a second period of time within the first field time, wherein the first paint voltage

induces liquid crystal material in the one pixel element to a third state; thereafter

In contrast, as discussed above, the portions of McKnight cited by the Examiner are references to applying voltages to a pixel in different fields or frames. Specifically, 154 and 155 in Fig. 2C represent different frames. In contrast, claim 1 recites specific actions within a first field time.

Further, as discussed above, McKnight only discloses changing a voltage applied to a common cover glass from Vcg to Vblack at t0-t1. In contrast, McKnight does not disclose applying a common single transition voltage to pixel elements via pixel electrodes, as recited above.

In light of the above, claim 1 is not anticipated by McKnight.

B. Claims 2-8

Claims 2-8, which depend from claim 1 are believed to be allowable for at least the same reasons given above, and more particularly, for the specific limitations they recite.

C. Claim 9

Claim 9 is asserted to be allowable for at least the same reasons given above for claim 1, and more particularly, for the specific limitations it recites.

D. Claims 10-16

Claims 10-16, which depend from claim 9 are believed to be allowable for at least the same reasons given above, and for particularly, for the specific limitations they recite.

E. Claim 17

Claim 17 is asserted to be allowable for at least the same reasons given above for claim 1, and more particularly, for the specific limitations it recites.

F. Claims 18-21

Claims 18-21, which depend from claim 17 are believed to be allowable for at least the same reasons given above, and for particularly, for the specific limitations they recite.

G. Claim 22

Claim 22 is asserted to be allowable for at least the same reasons given above for claim 1, and more particularly, for the specific limitations it recites.

H. Claims 23-30

Claims 23-30, which depend from claim 22 are believed to be allowable for at least the same reasons given above, and for particularly, for the specific limitations they recite.

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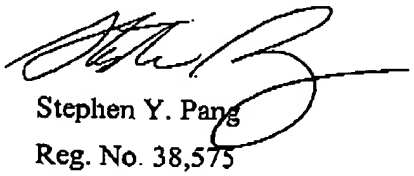
CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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Attachments

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